In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1. A method of synthesizing music in a digital system, comprising the steps of:

accessing a digital analysis waveform having a first duration, a first pitch, a first attack portion and a first decay portion;

determining a second duration and a second pitch for a synthesis waveform;

computing first timing marks for the analysis waveform such that the first timing marks correspond to periodicity of the analysis waveform;

computing second timing marks for the synthesis waveform such that the second timing marks correspond to periodicity of the synthesis waveform; ~~and~~

calculating samples for each period of the synthesis waveform defined by adjacent second timing marks using samples selected from a corresponding period of the analysis waveform defined by adjacent first timing marks to form the synthesis waveform having the second pitch, the second duration, a second attack portion and a second decay portion; and

wherein the step of calculating samples to form the synthesis waveform includes

determining whether the duration of the synthesis waveform is greater than the duration of the analysis waveform,

if the duration of the synthesis waveform is greater than the duration of the analysis waveform synthesizing the second attack portion by pitch modification of the analysis waveform and the synthesizing the second decay portion by pitch modification and duration extension, and

if the duration of the synthesis waveform is not greater than the duration of the analysis waveform synthesizing both the second attack portion and the second decay portion by pitch modification.

2. (Canceled)

3. (Currently Amended) ~~The~~ A method of ~~Claim 2~~ synthesizing music in a digital system, comprising the steps of:

accessing a digital analysis waveform having a first duration, a first pitch, a first attack portion and a first decay portion;

determining a second duration and a second pitch for a synthesis waveform;

computing first timing marks for the analysis waveform such that the first timing marks correspond to periodicity of the analysis waveform;

computing second timing marks for the synthesis waveform such that the second timing marks correspond to periodicity of the synthesis waveform; and

calculating samples for each period of the synthesis waveform defined by adjacent second timing marks using samples selected from a corresponding period of the analysis waveform defined by adjacent first timing marks to form the synthesis waveform having the second pitch, the second duration, a second attack portion and a second decay portion, step of calculating samples for each period further comprising the steps of:

calculating a set of samples for a period m using a first cosinous window,

calculating a set of samples for a period m-1 using a second cosinous window,

combining the set of samples for period m and the set of samples for period m-1 using a weighting function, and

wherein the first cosinous window operates on two adjacent periods and the second cosinous window operates on two adjacent periods shifted by one period from the first cosinous window.

4. (Original) The method according to Claim 3, further comprising the step of reversing a selected one of the set of samples before the step of combining the sets of samples.

5. (Original) The method according to Claim 4, wherein the step of reversing is performed only when two consecutive periods of the synthesis waveform are formed using same periods of the analysis waveform; and

wherein the step of reversing is responsive to a random number generator.

6. (Currently Amended) ~~The~~ A method of ~~Claim 2~~ synthesizing music in a digital system, comprising the steps of:

accessing a digital analysis waveform having a first duration, a first pitch, a first attack portion and a first decay portion, said first attack portion corresponding to where said waveform builds up to crescendo and then subsides;

determining a second duration and a second pitch for a synthesis waveform;

computing first timing marks for the analysis waveform such that the first timing marks correspond to periodicity of the analysis waveform;

computing second timing marks for the synthesis waveform such that the second timing marks correspond to periodicity of the synthesis waveform;

calculating samples for each period of the synthesis waveform defined by adjacent second timing marks using samples selected from

a corresponding period of the analysis waveform defined by adjacent first timing marks to form the synthesis waveform having the second pitch, the second duration, a second attack portion and a second decay portion; and

wherein the step of calculating samples forms the synthesis waveform such that the second attack portion has a duration approximately equal to a duration of the first attack portion.

7 to 13. (Canceled)

14. (New) The method according to claim 1, wherein:

said step of synthesizing the second attack portion by pitch modification of the analysis waveform if the duration of the synthesis waveform is greater than the duration of the analysis waveform and said step of synthesizing both the second attach portion and the second decay portion by pitch modification if the duration of the synthesis waveform is not greater than the duration of the analysis waveform employs the equation:

$$Ia = Is * Ks1$$

where: Ia is the analysis time mark index having a range from 0 to Na-1; Is is the synthesis time mark index having a range from 0 to Ns-1; and Ks1 is a fraction factor equal to Ts/Ta, where Ts is the duration of the synthesis waveform and Ta is the duration of the analysis waveform; and

said step of synthesizing the second decay portion if the duration of the synthesis waveform is greater than the duration of the analysis waveform employs the equation:

$$Ia = Is * Ks2$$

where: Ks2 is a fraction factor equal to (Ts*Da2)/(Ta*Ds2), where Da2 is the duration of the decay portion of the analysis waveform and Ds2 is the duration of the decay portion of the synthesis waveform.